STATE LIBRARY OF PENNSYLVANIA
docs,pa PY S9642.2 R425f
Report on the flooding event i
0 0001 00064942 4

Digitized by the Internet Archive
in 2017 with funding from
This project is made possible by a grant from the Institute of Museum and Library Services as administered by the Pennsylvania Department of Education through the Office of Commonwealth Libraries

https://archive.org/details/reportonflooding00cair

R425f
1975

STATE LIBRARY OF PENNSYLVANIA
General Library Bureau
Government Publications Section

23 f

REPORT ON THE FLOODING EVENT IN THE SUSQUEHANNA RIVER BASIN FEBRUARY 23-26, 1975

SUSQUEHANNA RIVER BASIN COMMISSION
5012 LENKER STREET
MECHANICSBURG, PENNSYLVANIA 17055

TABLE OF CONTENTS

	Page
Causal Factors	1
Effects	3
Conclusions	9
Hydrologic Subbasins	Attachment #1
Daily Temperatures	Attachment #2
Snow Cover	Attachment #3
Stream Discharge Levels	Attachment #4
Daily Precipitation	Attachment #5
Flood Crests Exceeding Flood Stages	Attachment #6
River Stage Reduction	Attachment #7

FLOODING SUSQUEHANNA RIVER BASIN
FEBRUARY 23-26, 1975

During the period February 23 through February 26, 1975, overbank streamflow occurred throughout the eight subbasins in the Susquehanna River Basin. (See Attachment 1) The objective of this report is to outline the meteorological conditions which caused the flooding and to describe the resultant flood damages and other effects on the basin.

Causal Factors

Several adverse meteorological factors combined to create high flows on basin streams and rivers in late February 1975. On Sunday, February 23, a storm originating in the Gulf of Mexico moved northeast into the Middle Atlantic Region. The storm brought heavy rains and unseasonably high temperatures into the entire basin.

Prior to the approach of the storm, weather, stream flow, and ground conditions were fairly close to normal in the river basin. Low temperatures on the 22nd of February ranged in the teens and twenties, these recordings coming mainly in the early morning hours. (See Daily Temperature Chart, Attachment 2) Significant snow cover in the basin was confined mainly to the New York and Northern Pennsylvania sections of the basin with most of the measurement stations reporting one or two inches of snow on the ground as of the 22nd. (See Attachment 3) Despite this seemingly light cover, National Weather Service personnel noted that snow cover reports from cities and towns

could not accurately represent snow cover amounts in the more remote forest and mountain areas. Therefore, snow depths in the more remote areas may have been considerably greater. Notably, stream discharge levels prior to the approaching storm were running about average for late February. (Flow levels actually dropped somewhat from the 22nd to the 23rd in the Juniata and Lower Susquehanna Subbasins, see Attachment 4). Finally, the Antecedent Precipitation Index, indicating ground moisture conditions, registered below the 1.00 level at all reporting stations on the 22nd, indicating no unusually high saturation levels. Thus, the stage was set for the entry of the Gulf storm on the 23rd.

Although the rain began falling on Sunday, February 23, the majority of the precipitation associated with the storm was recorded on the 24th and 25th. Accumulations of one to two inches of rain or more were not uncommon at basin recording stations over the three day period, 23rd through 26th. (See Attachment 4, Daily Precipitation Chart)

Along with the rains came an abrupt rise in temperature. From the sub-freezing lows of the preceding several days, temperatures shot up into the 50's and low 60's. (See Attachment 2) Naturally, this contributed to rapid snow melt in the upper basin, adding runoff water to streams and rivers already swollen by the heavy rainfall.

Effects

The effects of the above meteorological activity were quickly felt. Stream discharge levels and stages rose dramatically on the 24th, 25th, and 26th. (See Attachments 4-6) Flood stage levels were exceeded at recording stations in six of the eight subbasins throughout the Susquehanna. Flood stages may have been exceeded at other points but reports were received from only those locations for which forecasts are provided. In Subbasins I & II in New York and in Subbasins IV & V encompassing the West Branch, most peak flows were recorded on the 25th of February. On lower portions of Subbasin III and on Subbasins VI, VII, & VIII, most peak discharges were measured on the 26th.

Although flood stages were exceeded at several points in the river basin, most affected communities reported no more than minor flooding.

In the New York part of the basin, reports of flooding problems came mainly from Steuben and Chemung Counties in Subbasin II. These problems consisted mainly of some road blockages and basement flooding. Civil Defense directors in both counties reported that no dollar damage figures were filed with their offices. New York DEC official Allen Buddle also reported no damages to existing flood control projects in the area. Minor problems arose in Elmira when some overflow occurred on Eldridge Lake because a permanent pump designed to

divert water into Diven Creek was disabled due to vandalism. However, city workers, using portable pumps, were able to prevent serious damage to the recreational facilities located near the lake in Eldridge Park.

Civil Defense, fire, rescue and other emergency personnel were effectively mobilized in both Steuben and Chemung Counties. These emergency units assisted in pumping basements, evacuating residents, and checking river levels, utilizing existing river gauges. Acting on river readings made by emergency personnel in Steuben County, Chemung County officials evacuated 25 families from one low-lying section of the Town of Chemung near the Chemung River. However, none of the homes evacuated sustained substantial flood damage.

Overall, citizens in the affected New York counties were highly responsive to the potential flood danger. Corning news sources indicated that many citizens were calling municipal officials, the National Weather Service, and newspapers in an effort to learn whether or not they should evacuate their homes. This was in contrast to the reluctant attitudes displayed by many residents during the June 1972 flooding. Apparently the Agnes experience convinced many residents that cooperation with emergency officials is essential.

In Pennsylvania, the most serious damage reports came from the Milton area of Northumberland County along the West Branch of the Susquehanna. Here, as in New York, basement flooding was

prevalent in some sections of the Borough of Milton. North of the Borough on Pennsylvania Rt. 405, several business establishments suffered first floor flooding which, among other things, damaged refrigerator-freezer units, carpeting, paneling, wallpaper, and some inventory. Turbot Township supervisors, in answering the Flood Insurance Study Questionnaires distributed by the Commission staff during Flood Insurance Coordination Meetings, stated that the February 1975 flooding affected 13 establishments north of Milton near Muddy Run, causing over $100,000 in damages. Nevertheless, early flood warning allowed most of the commercial inventories to be evacuated to second floors and/or higher ground, thereby reducing potential additional flood loss. Extensive road flooding in and around Milton forced cancellation of classes in two nearby school districts.

Another community beset with some minor flooding difficulty was the Town of Bloomsburg. Although there was little if any structural damage reported in the Town, there was some incidence of backwash and erosion. A number of house trailers had to be pulled out of low-lying trailer parks. Problems also developed at the construction site of the new addition to the Bloomsburg Sewage Treatment Plant. Workers tried unsuccessfully to prevent inundation through sandbagging. Ultimately, however, flood waters did little damage to the site. At the sewage treatment plant itself, high water did cause some temporary disruption of the chlorination and algae removal processes.

Across Fishing Creek from Bloomsburg in the community of Fernville, road closings, basement flooding, and summer cottage flooding abounded. Two water mains across Fishing Creek which brought water into Fernville from the Bloomsburg Water Company were broken when struck by floating debris. Firehoses were then strung across a bridge to temporarily supply water to Fernville until water company crews could replace the broken mains.

Most other sections of the Pennsylvania basin reported fewer problems. At Lock Haven, the West Branch fell just short of flood stage, causing several hours of anxiety for downtown residents and businessmen. Fire and police vehicles equipped with public address systems cruised the city warning of potential flood danger. Residents quickly moved basement and first floor valuables to upper floors or higher ground. The Piper Aircraft Corporation moved approximately 100 aircraft valued at $15 million to higher ground in anticipation of possible flooding. Some were flown to a completed section of the U.S. 220 By-pass west of Avis, Pa., while others were moved to a ramp area built for such emergencies adjacent to the Piper plant.

In Wilkes-Barre, the dikes turned away the flood waters. In nearby Falls, Wyoming County, water did enter the basements of some 30 to 40 homes. Again, however, most valuables were removed from basements before serious damage could occur. Kingston Borough, drawing on lessons learned during June 1972, quickly mobilized its emergency forces. Approximately 15,000

sandbags were readied and sand was loaded into Borough trucks but fortunately was not needed.

The Sunbury area encountered some flooding difficulties. For example, flood waters damaged machinery at the construction site of the Northumberland Borough Sewage Treatment Plant. Workers wisely flooded several large empty tanks on the site and thus prevented them from being floated and washed down the river. The state boat marina near Northumberland also received slight damage with the loss of a few picnic tables and a mud coating on the parking lot. As in most other affected areas of the basin, rural road flooding plagued Sunbury area residents. One major thoroughfare that had to be closed was U.S. Rt. 11 between Shamokin Dam and Northumberland. Altogether, PennDOT officials estimated that sections of 45 secondary and rural roads were closed in Pennsylvania due to the February flooding.

Moving into the Maryland part of the basin, consultation with Harford and Cecil County Civil Defense officials revealed little or no damage caused by the February high water. About the only notable effect was the flooding of Maryland Rt. 222 between Port Deposit and Conowingo Dam because approximately 20 gates on the Dam were opened to accommodate high river flow.

By way of summarizing the flood damages in the Susquehanna River Basin during February 23-26, 1975, it can be stated that they fortunately were light in most areas. Early flood damage reduction and rescue operations, prompted largely by flood

warning reports, proved especially effective in helping to keep the damage toll down. This, of course, underscores the need for maintenance and expansion of flood forecasting and early warning systems throughout the Susquehanna River Basin.

Another factor in reducing flood damages was the network of upstream retention reservoirs operated by the U.S. Army Corps of Engineers. Attachment 7 shows river stage and flood discharge reductions resulting from upstream retention at selected gaging stations throughout the basin during the February 1975 flooding.

During periods of high flow such as experienced in February, water quality in the Susquehanna and the Upper Chesapeake Bay is always affected. Water quality records specific to the period February 23-26 were not immediately available; however, based on past water quality records during high flow periods, it is possible to make some generalizations as to conditions in the river and the Upper Bay.

U.S. Environmental Protection Agency Technical Report #56 entitled "Nutrient Enrichment and Control Requirements in Upper Chesapeake Bay" provides charted estimates of nutrient load in the Susquehanna for varying flows at Conowingo, Maryland. Peak flow at Conowingo during February 1975 was recorded at 369,300 cfs. At this rate, approximately 480,000 lbs./day of total phosphate and 3,000,000 lbs./day of total nitrogen were flowing past the Conowingo monitoring station. According to the EPA report, the primary source of nutrients in the river is agricultural runoff, a nonpoint source, with some contributions also coming from urban

storm water and sewer overflows from major metropolitan areas.

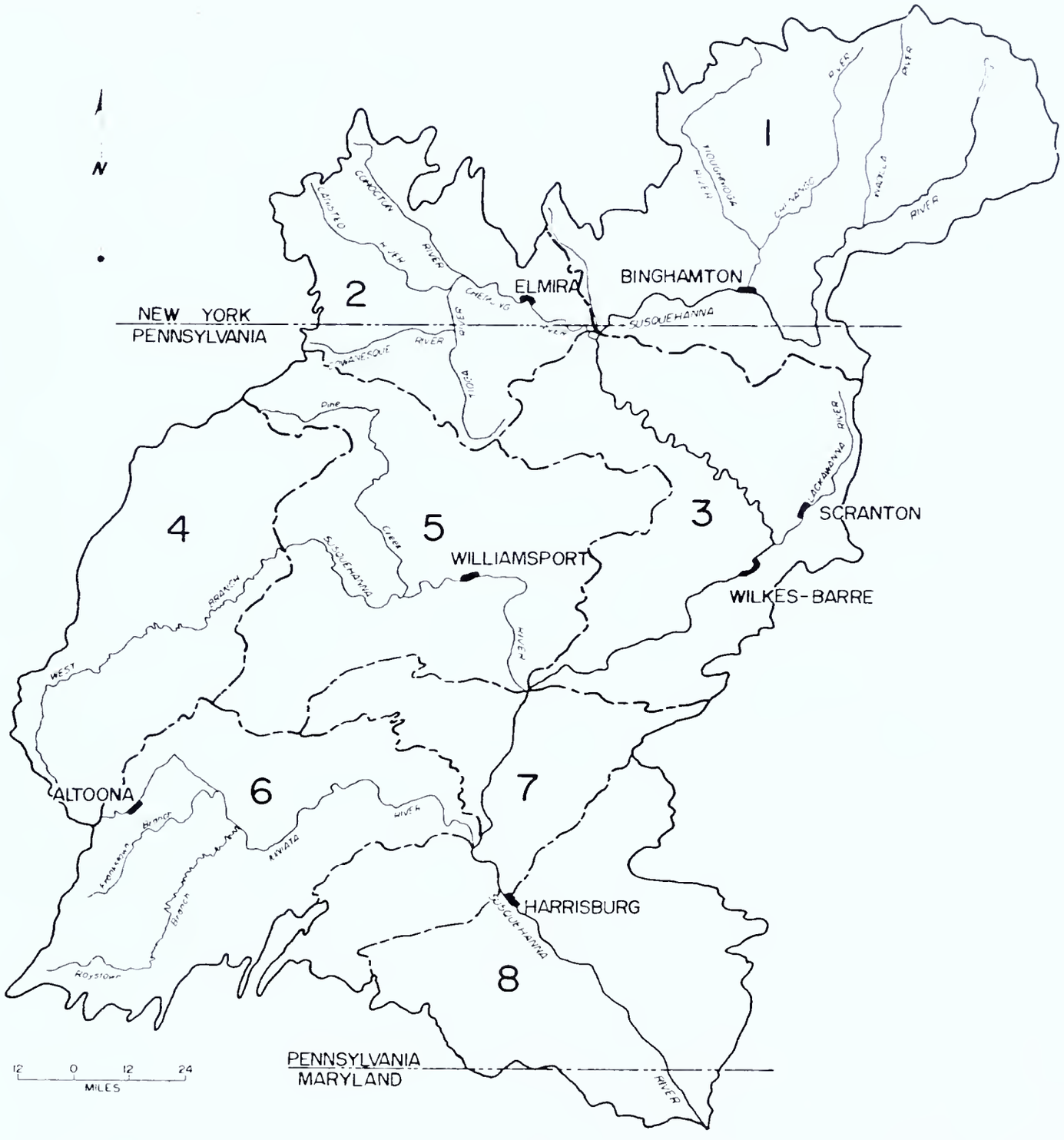
Salinity in the Upper Bay is also greatly affected by high flows. According to the Chesapeake Bay Institute of Johns Hopkins University, during high flow periods, flow from the mouth of the Susquehanna effectively extends as much as 28 miles into the main body of the Bay, in effect turning the Upper Bay into a fresh water lake. Presumably a somewhat similar condition existed in the Upper Bay in late February 1975. Of course, rapid changes in the salinity levels have an impact on the ecosystem of the Upper Bay.

Conclusions

To briefly summarize, the flooding which took place in the Susquehanna River Basin in February 1975 ranked low in intensity, duration, and, fortunately, damage. Estimates place the average frequency of the flood at about the 4- to 5-year level throughout the basin. No area of the basin inundated by the flood waters remained underwater for more than 24 to 36 hours. The flooding itself was limited mainly to the extreme lowlands, roads, and basements, causing only light damages and minor disruption. In fact, the storm and the accompanying flooding were such that the U.S. Army Corps of Engineers - Baltimore District was unable to produce meaningful damage estimates. Most of the problems that did arise in connection with the flooding were handled adequately by local officials.

Despite its relatively minor nature, the February 1975

flooding served as a reminder of the ever present need for the Commission to vigorously maintain its efforts under the Flood Plain Management and Protection program of the Comprehensive Plan. Flood forecasting and warning systems, which proved so valuable in reducing losses during this particular flood, should be further upgraded through the installation of additional forecasting equipment and recruitment of additional volunteers for local observation and reporting and for carrying out emergency procedures. The Commission should continue to encourage wise flood plain management practices among local government jurisdictions in the basin so that the potential for flood damage is significantly reduced.



THE SUSQUEHANNA RIVER BASIN COMMISSION

UNITED STATES·NEW YORK·PENNSYLVANIA MARYLAND

HYDROLOGIC SUBBASINS

DAILY TEMPERATURE*

High - Low

SUBBASIN I	Feb. 22	Feb. 23	Feb. 24	Feb. 25	Feb. 26
Vestal	43-23	53-32	48-37	51-37	37-28
Cortland	45-22	54-28	46-39	49-36	38-34
Norwich	46-15	54-28	45-35	51-34	38-29
Bainbridge	55-18	50-34	46-31	49-31	40-31
Binghamton	50-27	43-34	46-38	38-28	34-27
SUBBASIN II					
Addison	46-19	59-33	54-38	59-31	38-30
Alfred	57-21	52-35	57-38	57-27	35-26
Bath	58-21	56-36	59-40	51-31	46-30
Elmira	47-19	57-21	50-36	50-37	40-31
SUBBASIN III					
Towanda	55-22	49-37	53-42	54-31	43-33
Montrose	43-20	53-27	46-35	47-35	37-28
Wilkes-Barre	56-28	51-40	56-47	55-34	46-35
Berwick	59-23	56-34	58-50	58-30	48-22
SUBBASIN IV					
Emporium	50-18	60-22	42-35	62-31	36-30
Philipsburg	50-22	52-39	55-40	40-29	38-29
Stevenson Dam	47-20	58-23	45-36	60-31	37-24
SUBBASIN V					
Lock Haven	50-25	-----	47-37	60-42	42-31
Williamsport	55-26	48-40	57-46	48-35	47-37
SUBBASIN VI					
Lewistown	60-23	52-36	60-44	60-32	49---
Raystown	49-24	58-25	53-40	66-33	41-33
Newport	51-22	58-24	50-41	58-35	46-34
SUBBASIN VII					
Sunbury	49-23	58-25	48-39	59-34	43-31
SUBBASIN VIII					
Harrisburg	59-26	51-40	60-47	50-33	49-36

* Source: National Oceanic and Atmospheric Administration - Climatological Data - February 1975.

DAILY TEMPERATURE

High - Low

SUBBASIN VIII (Cont'd)	Feb. 22	Feb. 23	Feb. 24	Feb. 25	Feb. 26
Carlisle	53-32	50-38	50-44	48-34	50-35
York	59-22	59-39	64-41	68-34	52-36
Lebanon	51-21	51-27	52-41	55-32	49-33

SNOW COVER (Inches)*

February 22, 1975
Susquehanna River Basin

SUBBASIN I

Vestal - 1"
Unadilla - 1"
Rockdale - 1"
Oneonta - 3"
Norwich - 2"
Cincinnatus - 1"
Binghamton - 1"

SUBBASIN II

Hornell - 1"
Alfred - 1"

SUBBASIN III

Towanda - Trace
Montrose - 4"
Wilkes-Barre - 0
Millville - 4"
Eagles Mere - 5"

SUBBASIN IV

Philipsburg - 1"
Galeton - Trace

SUBBASIN V

Lock Haven - Trace
Williamsport - Trace

-- Subbasins 6-8 report little or no snow cover.

* Source: National Oceanic and Atmospheric Administration Climatological Data - February 1975.

STREAM DISCHARGE LEVELS*

Cubic Feet Per Second
(7:00 a.m. recordings)

SUBBASIN I	Feb. 22	Feb. 23	Feb. 24	Feb. 25	Feb. 26
Bainbridge (Susquehanna)	1,900	2,100	6,300	19,900	20,900
Conklin (Susquehanna)	2,800	3,100	11,500	30,500	27,600
Vestal (Susquehanna)	5,000	5,900	18,600	57,000	52,300
Greene (Chenango)	726	856	2,900	9,700	8,200
Chenango Forks (Chenango)	400	---	8,700	22,400	18,200
Cincinnatus (Otselic)	100	---	800	4,800	1,500
SUBBASIN II					
Chemung (Chemung	2,200	2,900	18,900	52,100	25,000
Lindley (Tioga)	800	1,200	11,700	14,300	4,700
W. Cameron (Canisteo)	---	800	5,600	---	2,600
SUBBASIN III					
Towanda (Susquehanna)	9,400	10,300	43,100	128,100	110,700
Wilkes-Barre (Susquehanna)	14,000	13,300	32,000	138,200	163,000
Danville (Susquehanna)	17,800	16,400	---	115,200	162,900
SUBBASIN IV					
Karthaus (W.B.)	4,100	4,200	23,200	25,700	16,000
Sinnemahoning (W.B.)	1,400	1,400	18,300	21,500	12,400
Renovo (W.B.)	7,100	6,700	31,400	62,000	43,700
SUBBASIN V					
Lock Haven (W.B.)	7,900	7,400	23,000	74,200	49,700
Williamsport (W.B.)	10,700	11,100	28,700	137,900	99,000
Lewisburg (W.B.)	13,800	13,800	26,500	129,600	127,000
SUBBASIN VI					
Saxton (Juniata)	2,700	2,700	6,300	8,700	6,100
Mapleton Depot (Juniata)	6,000	5,700	14,600	20,900	15,900
Lewistown (Juniata)	8,500	7,700	15,600	26,000	22,100
Newport (Juniata)	11,700	10,400	15,500	---	---
SUBBASIN VII					
Sunbury (Susquehanna)	33,500	31,400	45,700	249,500	297,500

* Source: River Forecasting Center - Harrisburg, Pa.

STREAM DISCHARGE LEVELS

Cubic Feet Per Second
(7:00 a.m. recordings)

SUBBASIN VIII	Feb. 22	Feb. 23	Feb. 24	Feb. 25	Feb. 26
Harrisburg (Susquehanna)	56,600	49,100	56,600	215,500	371,100
Conowingo, Md.	58,300	56,200	68,300	224,200	369,300

DAILY PRECIPITATION (Inches)*

SUBBASIN I	Feb. 22	Feb. 23	Feb. 24	Feb. 25	Feb. 26
Vestal	0	.37	.77	.80	.22
Unadilla	0	.30	.61	.77	.13
Rockdale	0	.24	.63	.86	.29
Bainbridge	0	.20	.82	.72	.01
Cincinnatus	0	.37	1.10	.72	.20
SUBBASIN II					
Chemung	0	.18	.94	.99	.20
Lindley	0	.23	.58	.72	T
Canisteo	0	.65	.74	.51	0
Bath	0	.42	.94	.39	0
Alfred	0	.28	.65	.80	.05
SUBBASIN III					
Towanda	0	.15	1.24	.78	.08
Wilkes-Barre	0	.05	1.38	.62	.06
Danville	0	.05	1.36	.66	.08
SUBBASIN IV					
Philipsburg	0	.87	.66	.13	T
Sinnemahoning	0	.31	1.52	.64	.33
SUBBASIN V					
Lock Haven	0	0	1.72	.43	.08
Williamsport	0	.83	1.76	.13	T
Jersey Shore	0	.22	1.60	.60	
SUBBASIN VI					
Lewistown	0	.23	.75	.83	0
Saxton	0	.31	.41	.25	0
Mapleton Depot	0	.30	.47	.27	T
Williamsburg	0	.26	.51	.27	0
Newport	0	.40	.53	.56	0
SUBBASIN VII					
Sunbury	0	.07	.98	.60	0

* Source: National Oceanic and Atmospheric Administration - Climatological Data - February 1975.

DAILY PRECIPITATION (Inches)

SUBBASIN VIII	Feb. 22	Feb. 23	Feb. 24	Feb. 25	Feb. 26
Harrisburg	0	.38	.92	.17	0
Carlisle	0	.48	.98	.25	0
York	0	.52	.32	.18	0

FLOOD CRESTS EXCEEDING FLOOD STAGES AT REPORTING STATIONS IN BASIN*

	STREAM	FLOOD STAGE	RECORDED FLOOD CREST DATE
SUBBASIN I			
Bainbridge	Susq.	13'	15.17' - 25 Feb. 75
Conklin	Susq.	11'	13.99' - 25 Feb. 75
Vestal	Susq.	18'	21.46 - 25 Feb. 75
Greene	Chenango	13'	13.27' - 25 Feb. 75
Chenango Forks	Chenango	10'	13.50' - 25 Feb. 75
Whitney Point	Tiough.	13'	13.50' - 25 Feb. 75
SUBBASIN II			
Chemung	Chemung	12'	17.02' - 25 Feb. 75
Lindley	Tioga	14'	15.56' - 24 Feb. 75
SUBBASIN III			
Towanda	Susq.	16'	20.13' - 25 Feb. 75
Wilkes-Barre	Susq.	22'	26.26' - 26 Feb. 75
Danville	Susq.	20'	21.57' - 26 Feb. 75
SUBBASIN V			
Williamsport	W.B.	20'	21.94' - 25 Feb. 75
Milton	W.B.	19'	23.00' - 25 Feb. 75
Lewisburg	W.B.	18'	21.98' - 25 Feb. 75
SUBBASIN VII			
Sunbury	Susq.	24'	25.77' - 25 Feb. 75
SUBBASIN VIII			
Harrisburg	Susq.	17'	18.57' - 26 Feb. 75

* Source: River Forecasting Center - Harrisburg, Pa.

FEBRUARY 1975 FLOOD - RIVER STAGE REDUCTIONS*

GAGE LOCATION/TIME (Crest Time)	UNREGULATED FLOW cfs	UNREGULATED FLOW Feet	UPSTREAM STORAGE & STAGE REDUCTION cfs	UPSTREAM STORAGE & STAGE REDUCTION Feet	CREST OBSERVED Flow	CREST OBSERVED Stage
Hornell, Canisteo River, N.Y. 1400 Feb. 24	5,050	9.00	2,050	1.93	2,260	7.07
Elmira, Chemung River, N.Y. 0200 Feb. 25	30,050	13.57	2,930	0.57	28,000	13.00
Chemung, Chemung River, N.Y. 0700 Feb. 25	54,950	17.38	2,700	0.36	52,250	17.02
Unadilla, Susquehanna River, N.Y. 2000 Feb. 25	12,710	11.07	1,950	0.82	10,800	10.25
Conklin, Susquehanna River, N.Y. 0400 Feb. 25	33,660	14.77	3,000	0.73	30,660	14.04
Bainbridge, Susquehanna River, N.Y. 1900 Feb. 25	23,690	16.50	2,050	1.03	21,640	15.47
Vestal, Susquehanna River, N.Y. 1400 Feb. 25	66,000	23.91	11,950	2.41	54,050	21.50
Chenango Forks, Chenango River, N.Y. 1100 Feb. 25	31,500	12.20	8,800	1.70	22,700	10.50
Towanda, Susquehanna River, Pa. 1500 Feb. 25	150,200	21.44	13,200	1.21	137,000	20.23
Archbald, Lackawanna River, Pa. 1100 Feb. 24	3,410	6.41	900	0.61	2,600	5.80

* Source: Mr. Michael Kanowitz, U.S. Army Corps of Engineers - Baltimore District, Chief, Reservoir Control Center.

FEBRUARY 1975 FLOOD - RIVER STAGE REDUCTIONS

GAGE LOCATION/TIME (Crest Time)	UNREGULATED FLOW cfs	UNREGULATED FLOW Feet	UPSTREAM STORAGE & STAGE REDUCTION cfs	UPSTREAM STORAGE & STAGE REDUCTION Feet	CREST OBSERVED Flow	CREST OBSERVED Stage
Wilkes-Barre, Susquehanna River, Pa. 0400 Feb. 26	177,400	27.74	14,800	1.48	162,600	26.26
Mapleton Depot, Juniata River, Pa. 2300 Feb. 24	26,600	15.20	5,700	1.82	21,140	13.38
Newport, Juniata River, Pa. 1200 Feb. 25	41,000	14.88	3,800	0.77	37,250	14.11

9133

WERT
BOOKBINDING
MIDDLETOWN, PA.
JULY 76
We're Quality Bound